Eye Disease

Eye Conditions Prevalent in Early Adult Life*

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THE author outlines the symtoms and treatment of those eye conditions which usually appear between the twentieth and fortieth years of life

IN considering eye conditions prevalent in early adult life, the span of years from 20 to 40 has been included, and it was deemed advisable to classify them according to: (1) developmental disorders; (2) focal infections; (3) systemic disorders; (4) muscle imbalances; (5) tumors; (6) drugs and beverages.

Developmental Disorders—Keratomalacia

In analyzing developmental disorders, those due to nutritional disturbances and those due to the onset of hereditary lesions must be considered. An example of the former is the so-called keratomalacia, or softening of the cornea which occurs in persons whose food is poor in fat content, where there is an insufficient absorption of fat, and in some liver conditions. Fortunately, it is seen very rarely in this country, but is observed in Russia, where the fasts are long. Cod liver oil is almost a specific in the treatment.

Interstitial Keratitis

Of the hereditary conditions which may make their first appearance at this time, probably the most important is interstitial keratitis, due to inherited syphilis. As a general rule, the symptoms come to the fore earlier in life, but they may be delayed until after the twentieth year. The disease is usually bilateral, both eyes being involved at the same time, and there is marked impairment of sight with cloudy cornea, redness and intolerance of light. The cloudiness of the cornea, when it occurs near the periphery, is followed by vascularization, giving rise to the so-called "salmon patch." There are, as a rule, some of the other associated symptoms and signs of the inherited disease present, the most common of which are: (1) Hutchinson's teeth—a notching of the upper central incisors on their cutting surface, or peg-shaped upper lateral incisors; (2) catarrhal deafness; (3) scars at the angles of the mouth; and (4) high arched palate. The interstitial keratitis, deformed teeth and catarrhal deafness are referred to as Hutchinson's trilogy, indicative of inherited syphilis. Fortunately, the cornea in most cases loses its cloudiness, so that a fair degree of vision is retained, normal vision not being an infrequent finding following an attack, the customary duration of which is from six to twelve weeks. At this time of life the first symptons of the hereditary retinal degenerations may put in an appearance. True, some of them can be recognized earlier by means of the ophthalmoscope, but the actual interference with sight and the symptom most commonly found—night blindness—may not be complained of before the third decade. Of this group, the outstanding example is retinitis pigmentosa. As previously stated, the chief complaint is night blindness, and the most important eye findings are a progressive atrophy of the specific elements of the retina and a deposit of pigment which lies in front of the blood vessels. A late complication is a posterior cortical cataract, and these cases usually progress to blindness, which does not ensue, however, until after the lapse of many years. Up to the present time treatment has been of no avail.

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Focal Infection

We next come to the large group of focal infections and these seem to be most prevalent early in adult life. Focal infection has been defined as a metastatic, systemic or local condition due to infectious micro-organisms or their toxins carried in the blood or lymph stream from a focus or foci of infection. A focus of infection is a localized or circumscribed area of tissue containing pathogenic micro-organisms and may be either primary or secondary. The most common foci of infection are: (1) the teeth; (2) the tonsils;

(3) the middle ear; (4) the nasal accessory sinuses; (5) the gastro-intestinal tract, including the gall bladder and appendix; (6) the genito-urinary tract, usually the prostate and seminal vesicles in the male, and the uterine mucosa in the female. The parts of the eye most frequently involved as the result of focal infection are: (1) cornea; (2) iris; (3) ciliary body; and (4) choroid. In all eye conditions where a focus of infection is suspected, a careful search should be made for it, the X-ray being used if necessary, and the cause eradicated. That focal infection is often the only cause of an eye condition is definitely proven by the following history of an illustrative case:

K. F., single, female, aged 35, first seen June 25, 1918, complaining of redness and pain in the right eye of one week's duration. Had two previous attacks, the first two and one-half years before, lasting eight weeks, the second five months before, lasting five weeks. Clinical picture, acute iritis right eye. Wassermann negative. July 1, 1918, right upper first bicuspid removed. July 9, 1918, fresh infection. August 12, 1918, some more teeth extracted. Slight recurrence in same eye in January, 1920, at which time three more teeth were extracted. Patient has remained free of trouble since—a period of over 16 years.

To guard against the possibility of focal infection causing eye trouble in adult life it is a good plan to have diseased tonsils removed during childhood and to have a semi-annual check-up of the teeth by a competent dentist.

Iritis

As the most common eye disease occuring as the result of focal infection is acute iritis, it might be well to say a few words about it. It is essentially a disease of early adult life, rarely seen in children and rather infrequently in the aged. Besides being caused by foci of infection, it may be due to many systemic diseases, chief among which are syphilis and tuberculosis, to metabolic disturbances, such as diabetes, gout and thyroid disorders, to injury, and as the result of sympathetic inflammation. The male sex seems to be affected more than the female, and the symptoms complained of are usually pain, redness, tearing, intolerance of light and diminution of vision. The pain is situated not only in the eye itself, but radiates to the parts in the vicinity, especially the bony region above the eye, and has a marked tendency to be worse at night. On examination of the eye, two groups of signs present themselves. The congestive group, due to the increased vascularity of the iris, which consists principally in a change of color of the iris—causing a blue or gray iris to appear greenish, but not being so clearly seen in the darker colored eyes—and, at times, the ability to recognize individual blood vessels. There is also narrowing of the pupil caused by the dilatation of the iris due to the fulness of the vessels and a spasm of the sphincter produced by the irritation. The other group of symptons is caused by the presence of the exudate. This is a serous or serofibrinous fluid which is poured out into the substance of the iris and the anterior and posterior chambers of the eye. The exudate in the iris aggravates the discoloration and the loss of pupillary reaction, while that in the anterior chamber causes a cloudy appearance of the aqueous, demonstrated by passing light through the pupil. This area normally appears black, but in iritis it is gray. When the particles which float in the aqueous sink to the bottom, a clearly defined yellowish mass is seen. At times when congestion is extreme, a collection of blood may be seen in the same location. The exudate poured out into the posterior chamber is not accessible to direct observation but shows itself in the form of adhesions between the iris and the anterior capsule of the lens which lies directly behind it. These cause the pupil to be irregular in shape, a fact which is demonstrated when atropine is instilled into the eye, and may, by interfering with the passage of the intraocular fluids, cause an increase of tension.

There are two eye conditions for which iritis is frequently mistaken, namely, conjunctivitis and acute glaucoma. There should be little difficulty in distinguishing an iritis from a conjunctivitis, which, in its acute form, is at times referred to as "pink eye," because of the presence of a mucous or a mucopurulent discharge, but, as the treatment of an acute glaucoma is exactly the opposite to that of an acute iritis, it may be a matter of serious import if this mistake in diagnosis is made. In general, glaucoma does not appear before the fiftieth year of life, but the important points of differentiation are that in iritis the pupil is smaller than normal and the tension of the eye is normal, or only very slightly increased, whereas in glaucoma the pupil is wide and the tension is markedly increased.

Systemic Disorders

We now come to a discussion of eye conditions seen as the result of systemic disorders. This particular group covers almost the entire field of ophthalmology and, needless to say, only the more important ones can be reviewed. For the purpose of ease of presentation they have been divided as follows: (1) diseases of the respiratory system; (2) diseases of the digestive system; (3) diseases of the cardiovascular system; (4) diseases of the genito-urinary system, including the so-called social diseases—syphilis and gonorrhea; (5) diseases of the nervous system; (6) metabolic disorders, including diseases of the ductless glands; (7) infectious diseases.

Respiratory System

In diseases of the respiratory tract—especially those associated with high fever and, very frequently, following a severe catarrhal condition of the upper air passages, with or without sinus involvement—a corneal disease known as herpes is often encountered. The initial sympton may be sharp pain, resembling that caused by the entrance of a foreign particle into the eye, followed rather shortly by redness and tearing. At times the corneal process shows a treelike distribution to which the term dendritic keratitis has been applied. If not promptly recognized and combated with proper treatment, there is a tendency to spread, and the centre of the cornea, over the pupil, may be involved, leading to the formation of a scar with subsequent visual impairment.

Associated with diseases of the nasal accessory cavities—the sinuses—there may be local involvement, resulting in periostitis or optic nerve pressure, giving rise to the so-called retrobulbar neuritis because of the fact that the optic nerve back of the eyeball is the part affected. This, in the acute form, causes marked and sudden diminution of vision and calls for prompt action in opening and draining the offending sinuses. The immediate and complete cure resulting therefrom is often little short of miraculous.

Digestive System

Reference has already been made, under the heading of focal infection, to the part teeth play in the production of eye diseases. The most frequent symptom of diseases of the liver and bile passages is jaundice, the first indication of which shows itself in the discoloration of the whites of the eye. In chronic jaundice the eyelids show the presence of superficial yellowish tumors which grow very slowly, never change their benign character and are removed only for cosmetic reasons. The symptom of night blindness is well recognized in diseases of the liver.

Cardiovascular System

Bleeding into the whites of the eye, the so-called "subconjunctival hemorrhages," while it is usually regarded with a great deal of apprehension, is not of serious import. Such hemorrhages are usually caused by the external condition or as the result of physical exertion and resorb without leaving any trace of visual impairment.

More grave are the sudden, partial or complete losses of vision in one eye which are the result of embolism or thrombosis of the central retinal artery. The degree of visual loss is dependent on whether the main trunk or one of its branches is occluded. This occlusion is promptly followed by nutritional disturbances and tissue changes in the retina, which, after a very brief time, are not capable of recovery. In cases of this nature a prompt widening of the vessels to permit the re-establishment of the circulation of blood is the end aimed at. This may be brought about by vigorous rotatory massage of the eye through the lids after the vessels have been temporarily widened by the inhalation of amyl nitrite. If this fails to bring about the desired result, the fluid in the anterior part of the eye should be drained off. This operation is known as paracentesis and the manner in which a favorable result is effected is in the sudden reduction of the intraocular tension caused by the rapid release of the fluid. In an attempt to maintain normal intraocular pressure, fresh blood quickly enters the eye, and this entrance of blood will, at times, cause the dislodging of the clot causing the obstruction and resulting visual impairment.

Inasmuch as the blood vessels of the eye are the only ones in the body which can actually be seen, many circulatory disorders can be diagnosed in this way, chief among which is arteriosclerosis.

Diseases of the Genito-Urinary System, Including Syphilis and Gonorrhea

Swelling of the lids is a well-recognized symptom of nephritis. It recurs, remains for a few hours or days at a time and then disappears. In the course of nephritis, the most important involvement of the eye is albuminuric retinitis. As the name would imply, it is an inflammatory state of the retina, characterized by hemorrhages and particularly by processes depending upon fatty degeneration. The general symptoms consist of headaches and gastric disturbances, accompanied by well-marked pallor, and the quantity of urine voided is large, of low specific gravity, greenish yellow in color and contains a slight quantity of albumin and no sediment.

In nephritis of pregnancy there may be severe retinitis, which shows itself as a rule during the last four months. It generally occurs in the first pregnancy and only occasionally in a later one without symptoms in preceding pregnancies. For the most part, there is complete return to normal, but optic atrophy may ensue.

In uremia there may be sudden, bilateral, complete loss of sight, with cerebral symptoms, convulsions and suppression of urine. The eye grounds are usually normal on examination except when uremia complicates an albuminuric retinitis. The attack lasts 12 to 24 hours and after two to three days vision returns to the previous state. It is seen more frequently in acute nephritis following scarlet fever than in chronic nephritis, pregnancy or labor.

Syphilis

When an analysis of eye conditions as to their etiological factor is made, it is astounding to learn what a large percentage is due to this cause. It is responsible for two per cent of all eye diseases and attacks almost every part of the structure of the eye which may be the site of entry for the general infection of the body, although more often it is secondarily involved. Both eyes are affected in nearly 50 per cent of the cases. It is interesting to note the percentages of positive blood tests. In inherited syphilis, the test is practically always positive, remaining so in spite of treatment. In acquired lesions, the percentage is much less, while in the tertiary or late stages only 50 to 75 per cent are positive. The parts of the eye affected also influence the blood test. In interstitial keratitis, an inherited form, the reaction is positive in 88 per cent; iridocyclitis, 50 to 60 per cent; choroiditis, 23 per cent; optic neuritis, 30 per cent; primary optic atrophy, 100 per cent; oculomotor paralysis, 52 per cent. Of six cases of paralysis of the sixth nerve there was not a single positive reaction. Among extragenital chancres, the eyelids are represented by three to four and one-half per cent, the favorite site being at the junction of the skin and conjunctiva near the inner angle of the eye. There is the usual swelling which later ulcerates, causing a conjunctival discharge, resembling an acute conjunctivitis. The lymph glands in the neighborhood are swollen. The positive diagnosis can be made by finding the exciting cause—the spirochetae—in the secretion from the ulcer. Secondary and tertiary lesions appear on the conjunctiva as on mucous membranes elsewhere. Reference has already been made to interstitial keratitis, which is usually an inherited condition, being seen in only three per cent of the cases of acquired syphilis.

The fifth nerve may be paralyzed, giving rise to a neuro-paralytic inflammation of the cornea which, because of the fact that it has lost its sensation, often ulcerates, with subsequent perforation and loss of the eye. The iris, sclera, choroid and retina may be the seat of inflammatory processes and the extraocular muscles may be paralyzed, but more important are the optic nerve conditions: optic neuritis with resulting secondary atrophy and primary optic atrophy in locomotor ataxia and general paresis, usually leading to incurable blindness.

Gonorrhea

If it is true that approximately 10 per cent of the population is infected with syphilis and perhaps a greater number with gonorrhea, it is both fortunate and surprising that so little gonorrheal conjunctivitis is seen. This inflammation is the direct result of the invasion of the conjunctiva by the gonococcus, the primary source of infection usually being the urethra. Within 48 to 72 hours there are swelling and infiltration of the membrane with occasional croupous membranes and a clear, watery, meat-infusion-like discharge. This soon becomes purulent and is present for about ten days to two weeks, at the end of which time the discharge becomes catarrhal. The important complication is the corneal affection, which may be benign or severe. In the latter case an ulcer forms rapidly and the entire cornea may be involved. The corneal tissue melts away and an iris prolapse results with marked or total loss of vision. In the treatment of this disease it is imperative to obtain a culture of the secretion at the earliest possible moment as the gonococcus can be identified with comparative ease. Energetic treatment must be instituted at once, as there is no time to lose in the fight against ulceration.

There is a metastatic form of gonorrheal conjunctivitis in which the discharge is not purulent and which is associated with joint complications.

Iritis may also be found as the result of invasion by the gonococcus. It may be unilateral or bilateral, is usually metastatic and does not lend itself to treatment as readily as iritis due to other causes, because of the fact that there are frequently associated diseases of the deeper structures which cause visual impairment.

Certainly with so large a percentage of eye cases due to syphilis and gonorrhea exacting such a tremendous toll of visual power, every effort should be made to spread the knowledge concerning these two ravages and a determined fight should be waged on all fronts to eradicate, as far as possible, these two great menaces to the human race.

Diseases of the Nervous System

The optic nerve and retina of the eye must be looked upon as a direct continuation of the brain, and, as a result of this anatomic relationship, the eye and the nervous system are closely associated. Brain tumors and abscesses are frequently diagnosed from an examination of the eye, 80 per cent of the former showing some definite change in the eye background. Many eye muscle paralyses will point the way towards clearing up some cerebral condition, and defects in the visual fields are of great importance in localizing brain lesions. Cerebral syphilis and the so-called metasyphilitic diseases—tabes or locomotor ataxia and general paresis—also have a multiplicity of eye symptoms.

Head injuries resulting in fractures of the skull, particularly the base, are associated with eye symptoms because of the location of the optic nerves and the central optic pathways.

Metabolic Disorders, Including Diseases of the Ductless Glands

The most important of the metabolic disorders is diabetes, which is essentially a disease of later life, but which is not infrequently seen during the years under consideration in this paper. From 20 to 33 per cent of diabetics have eye complications, and cataracts form 30 per cent of these. Occasionally a diabetic will notice that the glass that has been worn with comfort over a period of time suddenly becomes inadequate. This is probably due to a change in the refractive index of one of the media of the eye and calls for a checkup of the sugar content of the blood. When this has been taken care of, the refractive error usually returns to its former state. Iritis and retinal hemorrhages are other eye complications of diabetes.

Of the ductless gland conditions—those glands having an internal secretion—the best known is goitre, and the form in which the eyes are involved—the so-called exophthalmic goitre—merits attention. It occurs most often between the twentieth and the fortieth years of life, and women are affected more often than men. Heredity, nervousness and hysteria predispose one to the disease, although a psychic or mental shock often serves as the actual cause. The predominant symptoms are the prominence of the eyes, the presence of a tremor, the tumor of the thyroid gland and a rapid pulse. It must be borne in mind that there may be an involvement of one eye only. The eyes at times become so far displaced forward that the lids fail to close over them, and because of exposure of the eyeball, especially during sleep, a drying of the cornea with resultant ulceration may ensue.

Lesions of the pituitary gland situated at the base of the brain have definite eye symptoms, particularly referable to the visual fields which show a bilateral loss of the temporal halves. Temporary disturbances of this gland occur during pregnancy but there is usually complete restoration to normal.

Infectious Diseases

Reference has already been made to a number of the more important infectious diseases, and under this heading tuberculosis alone will be presented. In tuberculosis, the eye is infected either directly or indirectly, more often the latter. The direct infection is either in the lids or the conjunctiva, or may also be an extension of tuberculosis of the face. In active pulmonary tuberculosis, eye complications are rare. Patients with eye tuberculosis may give a suspicious family history, or tell of some eye trouble early in life, but the majority of them appear in blooming health. In every chronic eye trouble of unknown origin tuberculosis must be suspected, and with the advances made in the detection of these cases with tuberculin, many positive diagnoses are possible. Ocular tuberculosis involves the conjunctiva in the form of ulceration, characterized by the presence of granulation tissue. In the cornea, various forms are seen, one closely resembling the interstitial keratitis of inherited syphilis. The scleral involvement, which is secondary to iritis, shows itself in the form of circumscribed red and painful areas which may disappear entirely. Involvement of the iris may result in a discoloration of it, giving rise to the condition known as *heterochromia iridis*, in which the two eyes are of different color, the lighter one always being the one affected. In the interior of the eye, choroiditis and retinitis are seen, and retinal detachment may be secondary to the former. In young adults, repeated hemorrhages in the vitreous and retina are another manifestation.

Fortunately, many of the forms of ocular tuberculosis lend themselves to treatment with tuberculin and startling cures have been reported as the result of the use of this exceedingly valuable therapeutic agent.

Muscle Imbalances

Improper muscle function, unless it is due to paralysis of an individual muscle, to which reference has already been made, should be incorporated with errors of refraction and will be presented elsewhere in the symposium. However, it might be well to emphasize the fact that eye symptoms arising in the course of one's daily occupation call for a careful study for the possible detection of an error of refraction and its prompt correction by adequate glasses. In this connection, it might be noted that the question of proper lighting, long neglected, is at last beginning to receive the attention it merits.

Tumors

The early detection of a tumor of the interior of the eye is very difficult, and any unexplained symptom of the eye, particularly if it interferes with vision, calls for repeated and careful examinations. The tumor of the eye most frequently found in adult life is the sarcoma of the choroid, which may, at times, be extremely malignant and cause secondary deposits in the liver and lungs with subsequent fatal outcome. There is no way in which this early spread can be detected, so that as soon as the positive diagnosis is made the eye should be removed.

Drugs, Alcohol and Tobacco

Of the drugs in common use affecting the eye, probably the best known is quinine. Of late years, owing to the fact that we rarely encounter malaria in and around New York City, the administration of this drug has been curtailed. It causes visual disturbances by affecting the optic nerve and the retina in a characteristic way. While the dose required to affect the vision is usually quite large, the English authors, Collins and Mayou, report a case in which defective sight was produced by the administration of five grams, the equivalent of 75 grains, over a period of 38 hours, and 12 grains has produced decided temporary diminution of vision in a susceptible and neurotic woman. Blindness is usually not permanent, but a marked loss of sight may persist. The condition is always bilateral.

In poisoning by lead there may be visual impairment, but the most common disturbance is paralysis of an ocular muscle.

The changes in the eye due to poisoning by salicylic acid or its derivatives, one of which is aspirin, are similar to those seen as the result of quinine poisoning but much less severe, as no cases of blindness have as yet been reported.

Atropine poisoning, due to the internal administration of belladonna, usually for some gastro-intestinal disorder, the external use of a plaster to combat local pain, or the instillation of drops for some eye condition, manifests itself by a very wide dilatation of the pupils, inability to read material close to the eyes, a rapid pulse, dryness of the throat and flushed face. If the administration is continued, there may be mental disturbances, even delirium. Where an idiosyncrasy exists, the instillation of atropine in the eye may cause itching and formation of follicles in the lids, or a severer reaction in the skin, at times resembling erysipelas.

Meat poisoning, especially the condition known as trichinosis, due to eating infected pork, may show itself in the form of puffy eyelids.

During the past few years a reducing agent known as dinitrophenol has been much in vogue. Its action is dependent, in part, upon increased metabolism and loss of fluid from the body in the form of perspiration. This is a very dangerous drug, since several cases of cataract have been reported as the result of its use.

Of all the poisons affecting the eye, alcohol is probably the most frequent. Ethyl alcohol is the form in which it is usually taken, although, during the era of prohibition, poisoning with methyl or wood alcohol, was not infrequent. The reports of sudden death or total blindness were often seen on the front pages of our newspapers, especially following New Year's parties. Ethyl alcohol poisoning of the eye occurs in a chronic form, as the result of imbibing whisky and brandy, and is practically never seen in beer or wine drinkers. The effects of alcohol are rarely seen before the age of 35 and most often in patients who also use tobacco. The first complaint is usually of fogged sight and later there is actual and marked visual impairment. The course is chronic, lasting for months or years. The prognosis, as regards blindness, is good. There are periods of improvement following abstinence from alcohol, but as soon as the drinking is resumed, the condition once more progresses. A characteristic finding is a central defect in the visual field and, in severe cases, no appreciation of red and green.

Tobacco is harmful to the eye because of its nicotine content. Its effect is similar to that of ethyl alcohol. Cigarette smoking seems to be the least harmful, strong cigars and pipe tobacco being the chief toxic conveyors. It occurs, as a rule, only in individuals who begin to smoke before the twenty-first year and symptoms appear from the fortieth year on. Up to the present time few cases have been reported in women but, as their habits with regard to the cocktail and cigarette have undergone a radical change during the past 20 years, we should expect to find mention of some in the literature soon.

In conclusion, let me emphasize the importance of securing prompt and efficient medical aid whenever eye trouble presents itself. Being a possession of such great value, only medical men specially trained for that purpose should be entrusted with the care of our eyes.

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